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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,600	10/20/2003	Makoto Morishima	520.43227X00	2551

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/687,600

Applicant(s)

MORISHIMA ET AL.

Examiner

Raymond Alejandro

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02/20/07.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4,5,15,17,18,20-23 and 26-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-5, 15, 17-18, 20-23 and 26-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/20/07 has been entered.

This correspondence is in reply to the amendment filed in connection with the aforementioned RCE. The applicant has overcome most of the 35 USC 112 rejections and the 35 USC 102 rejection over Kidai et al'651. Refer to the abovementioned amendment for substance of applicant's rebuttal arguments and remarks. However, the present claims (including newly added claims 26-31) are again rejected over at least one of the previously stated grounds of rejection as shown hereunder and for the reasons of record:

Election/Restrictions and Claim Disposition

1. Claims 9-11 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 05/11/06.
2. Claims 1-3, 6-8, 12-14 and 19 have been cancelled; and claims 24-25 were not entered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 4-5, 15, 17-18, 20-23 and 26-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure (including the claims) of the invention. The added material which is not supported by the original disclosure is as follows: (claim 26) the language "*a plurality of anode plates*" and "*a plurality of cathode plates*" is unsupported by the as-filed disclosure. A point that needs attention from the applicant is that pages 18-19 discloses the formation of anode/cathode wiring layers 15, 12, respectively to further form respective anode/cathode wiring sheets, and if applicant is equating the term "plates" to "sheet", then there is only two (2) single plates (not a plurality of anode plates and a plurality of cathode plates). On the other hand, the disclosure appears to support a plurality of first wiring layers and a plurality of second wiring layers. Applicant is requested to take this into account and to further elaborate on how that disclosure circumscribes the invention as instantly claimed by the applicant. Accordingly, there is simply no support for the above limitation in the as-filed specification. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4-5, 15, 17-18, 20-23 and 26-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claims 26-27 recite the limitation "the plurality of anodes" in line 6 (claim 26) and in line 2 (claim 27). There is insufficient antecedent basis for this limitation in the claim.

8. Claims 26-27 recite the limitation "the plurality of cathodes" in lines 7-8 (claim 26) and in line 4 (claim 27). There is insufficient antecedent basis for this limitation in the claim.

9. Claim 26 recites the limitation "the first electrically conductive current collecting plates" and "the second electrically conductive current collecting plates" in lines 8-9. There is insufficient antecedent basis for this limitation in the claim. Note that claim 26 recites "a plurality" of both "first electrically conductive current collecting plates" and "second electrically conductive current collecting plates". At this point, it is immediately unclear whether the former is intended to recite all of the "plurality of" the latter (i.e. plurality of first/second electrically conductive current collecting plates).

10. The language "*with each other through respective slots, of said slots of said electrolyte membrane*" in claim 26 is of uncertain meaning, thereby rendering the scope of the claim vague. In the context of the present invention, the meaning of the recitation "*respective slots, of said slot*" is not well-understood and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

11. Claim 26 is further rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted

Art Unit: 1745

structural cooperative relationships are: the cumulative uncertainties, unclearness or indefiniteness as set forth in items 4 and 7-10 fail to render a clear description or definition of the specific scope of the claimed invention. At this point, it is very unclear to the examiner to determine whether applicant's invention makes reference to a single structure comprising a plurality of components, or plural components comprising a plurality of components or a single structure comprising a single component further comprising a plurality of features forming only said single component. Applicant's cooperation to clarify those uncertainties, unclearness or indefiniteness is required.

12. Claims 28-29 recite the limitations "said slots" (claim 28, line 2) and "a plurality of slots" (claim 29, line 2). There is insufficient antecedent basis for this limitation in the claim. Claim 29 depends from claim 28 which also depends upon independent claim 26. In view of the slots recited in both claims 26 and 28, it is immediately unclear whether applicant's intent is to recite additional slots (a plurality of second slots) or same slots of claims 26 and 28.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 1745

14. Claims 4-5, 20-21 and 26-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Choi 6689502.

As to claims 26-27:

Figures 2B below of Choi illustrates a conventional electrochemical cell comprising anodes 2a disposed at one side of an ion exchange membrane 1a and cathodes 3a disposed at the opposite sides (COL 2, lines 12-26). In order to electrically connect the respective cells, a connection wire 4 connecting anode 2a and cathode 3a of neighboring cells must pass through the ion exchange membrane 1a between the anode 2a and the cathode 3a. In this case, a path or hole for passage of the connection wire 4 must be provided in the ion exchange membrane 1a (COL 2, lines 12-26). Disclosed is that both of the anode 2 and the cathode 3 include a support layer for supply and diffusion of fuel (COL 1, lines 28-32). *These support layers may serve as the plurality of wiring plates covering respective anodes/cathodes. Thus, they all are either electrically connected, operatively connected and/or physically connected.*

A conventional monopolar cell pack is constructed such that anodes 2a are disposed at one side of an ion exchange membrane 1a and cathodes 3a corresponding to the anodes 2a are disposed at the opposite side, as shown in FIGS. 2A and 2B. In order to electrically series-connect the respective cells, a connection wire 4 connecting the anode 2a and cathode 3a of neighboring cells must pass through the ion exchange membrane 1a between the anode 2a and the cathode 3a. In this case, a path or hole for passage of the connection wire 4 must be provided in the ion exchange membrane 1a. However, since the path or hole is likely to cause leakage of fuel, a path or hole portion should be sealed. If the connection wire 4 does not pass through the ion exchange membrane 1a, the connection wire 4 must be re-routed outside the cell pack.

FIG. 2B (PRIOR ART)

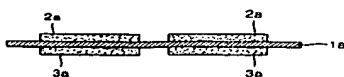


Figure 9 also illustrates a plurality of first anodes 121 disposed in a row on a first surface of an ion exchange membrane, and a plurality of first cathodes 131 disposed on the second surface of the ion exchange membrane (COL 6, lines 45-50).

As to claims 20-22:

Choi discloses that in order to electrically series connected the respective cells, a connection wire 4 connecting anode 2a and cathode 3a of neighboring cells must pass through the ion exchange membrane (COL 2, lines 15-21). *This disclosure implies connecting multiple cells together, therefore, in a configuration serially connecting at least three (3) cells (1st cell connected to 2nd cell connected to 3rd cell), it can be reasonably concluded that the slots are formed around the cathodes/anodes of the 2nd cell and positioned between adjacent anodes/cathodes; a slot is independently provided between every two adjoining anodes/cathodes (one slot between 1st cell and 3rd cell).*

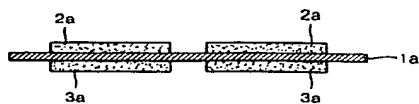
Concerning claims 4-5:

Choi discloses preparing a catalyst slurry by mixing a Pt-Ru catalyst for anode, and a Pt catalyst for cathode, an IPA solution and Nafion (the ion conducting polymer or the electrolyte), being deposited on a carbon black material (COL 8, lines 10-25).

Concerning claims 28-31:

As shown in **Figure 2B** below, Choi illustrates a single-continuous membrane 1a within the monopolar cell pack (See Figure 2B).

FIG. 2B (PRIOR ART)



Art Unit: 1745

Consequently, the present claims are anticipated.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 15 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi 6689502 as applied to claim 26 above, and further in view of Kidai et al 2005/0074651.

Choi is applied, argued and incorporated herein for the reasons expressed above.

However, the preceding reference fails to fairly disclose the specific insulating sealant and non-electrical connection of the slot.

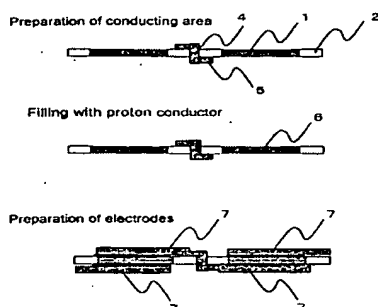
As to claim 15:

Figure 6 below of Kidai et al depicts a polymer electrolyte membrane comprising a plurality of electrodes 7 consisting of respective electrode substrates and electrocatalyst layers

Art Unit: 1745

(P.0058). Porous area 1 is filled with Nafion (EXAMPLE 1/ P0100-0103). *If porous area filled with Nafion represents the electrolyte membrane having slots, then, the pores are filled with Nafion which is an electron non-conductive material.*

Fig. 6



As to claims 22-23:

The anode, cathode and electrolyte are separated by a separator (P0005). *In the instant case, the separators serve as the plurality of wiring plates covering respective cathodes and anodes. Furthermore, in fuel cell, respective fuel cell components are either electrically connected, operatively connected or physically connected; and they all are also either directly or indirectly connected. If the membrane permeating area having the electron conductor through membrane 5 is taken to represent the membrane/slot, then the separator plates are both electrically and operatively connected. On the other hand, if porous area filled with Nafion represents the electrolyte membrane having slots, then the separator plates are at least operatively connected. Therefore, not every slot is used for electrical connection.*

Compounding the above teachings, it would have been obvious to a skilled artisan at the time the invention was made to use the specific insulating sealant of Kidai et al at the specific location in the chemical cell of Choi as Kidai et al teach that an electron non-conductive material is suitable for filling the slots/openings in a membrane. In this instance, the use of an insulating

Art Unit: 1745

material is necessary so as to avoid a short circuit in the electricity-generating chemical cell; and it is useful regardless of the specific intended use of that material.

With respect to the specific non-electrical connection of the slot, a skilled artisan would have found obvious at the time the invention was made to use or not use every slot for electrical connection (non-electrical connection of the slot) of Choi as taught by Kidai et al for the benefit of providing the most suitable electrical arrangement as taught by Kidai et al so as to avoid internal short-circuiting of the electricity-generating chemical cell.

18. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi 6689502 as applied to claim 26 above, and further in view of Lawrence et al 2004/0013927.

Choi is applied, argued and incorporated herein for the reasons expressed above. However, the preceding reference fails to fairly disclose the specific plastic sheet.

Lawrence et al disclose the use of a sheet plastic material in fuel cells because it is impervious to methanol (CLAIM 11/ABSTRACT).

With these teachings, a person of ordinary skill in the art would have found obvious at the time the invention was made to use the specific plastic sheet of Lawrence et al as a cover of Choi's cells because Lawrence et al discloses that such a sheet plastic material is impervious to methanol. Therefore, one skilled in the art would have reasonably expected that the advantages discussed in Lawrence et al would have also been achieved by using a plastic sheet to cover the cell of Choi.

Response to Arguments

19. Applicant's arguments filed 02/20/07 have been fully considered but they are not persuasive.

20. There is no need to address applicant's arguments concerning Kidai et al'651 as applied under Section 102 because such a rejection has been withdrawn.

21. Very importantly, applicant has argued that the claimed invention as set forth in independent claim 26 defines patentable matter because limitations such as "direct methanol fuel cell", "serially-connected", "connected in series, or in parallel", "small thickness" (in reference to a specific thickness), "sealing the slots" are not disclosed by the prior art (See pages 12-14 of applicant's amendment dated 02/20/07). Yet further, applicant has also argued that independent claim 26 is not unpatentable because such a claim recites limitations such as "single" and "continuous" membrane are not taught in the prior art (See page 18 of applicant's amendment dated 02/20/07). However, it is noted that the features upon which applicant relies are not recited in the rejected independent claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, applicant's arguments are not commensurate in scope with the presently claimed invention.

22. With particular respect to the limitations "single" and "continuous" membrane, the examiner contends that each individual membrane of Choi represents a single membrane per se, and each of them is continuous at least within certain area, zone or periphery or in certain length encompassing micro-dimensions such as being continuous along a length of a micrometer, or an area of a micro-square centimeter. The interpretation of these limitations in the meaning of the

Art Unit: 1745

intended recitation is not equivalent to claiming that one-single membrane is a continuous membrane along the entire periphery/area of the one-single membrane or all around that one-single membrane as apparently argued by the applicant (*←Emphasis provided*).

23. With respect to Choi, applicant has advanced the argument that “*the first and second wiring plates, connected through respective slots*” are not taught. In fact, Choi evidently discloses that in order to electrically connect the respective cells, a connection wire 4 connecting anode 2a and cathode 3a of neighboring cells must pass through the ion exchange membrane 1a between the anode 2a and the cathode 3a. In addition to that, disclosed is that both of the anode 2 and the cathode 3 include a support layer for supply and diffusion of fuel (COL 1, lines 28-32). Literal claim scope permits to reasonably interpret the language of the claimed invention absent any specific structural limitation of what is meant by “wiring plates”. As such, the examiner contends that these support layers may serve as the plurality of wiring plates covering respective anodes/cathodes; and it can also be said that they all are either electrically connected, operatively connected and/or physically connected. Present claim also fails to specifically define what kind of connection is currently intended.

24. In response to applicant's argument that the specific connection of the anode-cathode plates is advantageous, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Additionally, teaching-away arguments are not germane to rejections based upon anticipation or under section 102.

Art Unit: 1745

25. With respect to applicant's arguments concerning Lawrence et al, the analyzed teachings of Lawrence et al, when construed in a broad context of material (plastic) usage or applicability, suggest that the applied reference contemplates the use of plastic materials to make an enclosing feature or a housing for a chemical cell, and consequently, such a suggestion would have been reasonably conveyed to a skilled artisan.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro

Application/Control Number: 10/687,600
Art Unit: 1745

Page 14

Primary Examiner
Art Unit 1745



RAYMOND ALEJANDRO
PRIMARY EXAMINER